

CLAIMS

I claim:

1 1. An electronic device, comprising:  
2       a first substrate;  
3       a second substrate; and  
4       a flexible connector attached between the first and second  
5 substrates by a plurality of contacts on a first and a second  
6 surface of the connector.

1 2. The electronic device of claim 1, wherein select contacts on  
2 the first surface of the connector are off-set from select  
3 contacts on the second surface of the connector.

1 3. The electronic device of claim 1, wherein the connector  
2 comprises a laminate material.

1 4. The electronic device of claim 3, wherein the laminate  
2 material comprises:

3       a core;  
4       a dielectric material surrounding the core; and  
5       a solder mask.

1 5. The electronic device of claim 4, wherein the laminate further  
2 includes a plated through hole.

1 6. The electronic device of claim 4, further including a  
2 connection layer between at least one contact on the first  
3 surface and at least one contact on the second surface.

1 7. The electronic device of claim 6, further including a ground  
2 shield over the connection layer.

1 8. The electronic device of claim 4, wherein the core comprises a  
2 material selected from the group consisting of: copper-invar-  
3 copper, copper, stainless steel, nickel, iron and molybdenum.

1 9. The electronic device of claim 4, wherein the dielectric  
2 material comprises polyimide.

1 10. The electronic device of claim 1, wherein the contacts  
2 comprise ball grid array connections.

1 11. The electronic device of claim 1, wherein the first substrate  
2 comprises a chip package.

1 12. The electronic device of claim 1, wherein the second  
2 substrate comprises a printed circuit board.

1 13. The electronic device of claim 1, further comprising a  
2 stiffener frame attached to the connector.

1 14. The electronic device of claim 13, wherein the stiffener  
2 frame is adhesively attached to the connector.

1 15. The electronic device of claim 13, wherein the stiffener  
2 frame surrounds a perimeter of the connector.

1 16. The electronic device of claim 13, wherein the stiffener  
2 frame is removably attached to the connector.

1 17. The electronic device of claim 13, wherein the stiffener  
2 frame is attached to a surface of the connector.

1 18. The electronic device of claim 13, wherein the stiffener  
2 frame comprises a material selected from the group consisting of:  
3 plastic, metal and ceramic.

1       19. The electronic device of claim 13, wherein the stiffener  
2       frame comprises a heat sink.

1 20. A connector system, comprising:  
2 a flexible substrate;  
3 a plurality of contacts formed on a first surface of the  
4 substrate; and  
5 a plurality of contacts formed on a second surface of the  
6 substrate, wherein select contacts on the first surface of the  
7 substrate are off-set from select contacts on the second surface  
8 of the substrate.

1 21. The connector system of claim 20, wherein the flexible  
2 substrate comprises a laminate material.

1 22. The connector system of claim 21, wherein the laminate  
2 material comprises:  
3 a core;  
4 a dielectric material surrounding the core; and  
5 a solder mask.

1 23. The connector system of claim 22, wherein the laminate  
2 material further includes a plated through hole.

1 24. The connector system of claim 22, further including a  
2 connection layer between at least one contact on the first  
3 surface and at least one contact on the second surface.

1 25. The connector system of claim 22, further including a ground  
2 shield over the connection layer

1 26. The connector system of claim 22, wherein the core comprises  
2 a material selected from the group consisting of: copper-invar-  
3 copper, copper, stainless steel, nickel, iron and molybdenum.

1 27. The connector system of claim 22, wherein the dielectric  
2 material comprises polyimide

1 28. The connector system of claim of 20, wherein the contacts  
2 comprise ball grid array connections.

1 29. The connector system of claim 20, further including a  
2 stiffener frame.

1 30. The connector system of claim 29, wherein the stiffener frame  
2 is removably attached to the flexible substrate.

1 31. A method of forming an electronic device, comprising:  
2 providing a flexible connector having a plurality of  
3 contacts on a first surface and a plurality of contacts on a  
4 second surface; and  
5 attaching the flexible connector between a first substrate  
6 and a second substrate via the contacts.

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1 32. The method of claim 31, wherein the flexible connector  
2 comprises a laminate material.

1 33. The method of claim 31, wherein the contacts comprises ball  
2 grid array connections.

1 34. The method of claim 31, wherein select contacts on the first  
2 surface of the flexible connector are off-set from select  
3 contacts on the second surface of the flexible connector.

1 35. The method of claim 31, wherein the first substrate comprises  
2 a chip package.

1 36. The method of claim 31, wherein the second substrate  
2 comprises a printed circuit board.

1 37. A method of forming an electronic device, comprising:  
2 providing a first substrate;  
3 providing a second substrate;  
4 providing a flexible connector having a plurality of  
5 contacts on a first surface of the connector and a plurality of  
6 contacts on a second surface of the connector, wherein select  
7 contacts on the first and second surface of the connector are  
8 off-set; and  
9 attaching the contacts on the first surface of the connector  
10 to the first substrate and the contacts on the second surface of  
the connector to the second substrate.

1 38. The method of claim 37, wherein the first substrate comprises  
2 a chip package.

1 39. The method of claim 37, wherein the second substrate  
2 comprises a printed circuit board.

1 40. The method of claim 37, wherein the flexible connector  
2 comprises a laminate material.

1 41. The method of claim 37, wherein the contacts comprise ball  
2 grid array connections.